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SIPHONOCLATHRUS
A NEW GENUS OF CHLOROPHYTA (SIPHONALES: CODIACEAE) FROM PANAMA

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Summary

A new genus and species of Chlorophyta (Siphonales: Codiaceae), *Siphonoclathrus stri,* collected at Galeta Reef, Panama, 9°24′18″N latitude, 79°51′53″W longitude, is described and illustrated.

Introduction

A new genus and species of green algae, Division Chlorophyta, designated here as *Siphonoclathrus stri*, was obtained by the authors while diving at Galeta Reef, Panama, 9°24′18″N latitude, 79°51′53″W longitude, on June 30 and July 1, 1971. During the following year, it was observed and collected repeatedly in all seasons. At first sight, the plant was recognized as new for the area, and subsequent investigation showed that it was an undescribed plant in the order Siphonales, closely related to the genera *Udotea* and *Flabellaria*, but distinctly different from any known genus.

Ecology

Plants were found growing on limestone and shells in 5 to 10 m depth at Galeta Reef near the Galeta field station of the Smithsonian Tropical Research Institute. The habit of the plant resembles that of *Caulerpa verticillata,* in that both form a delicate green mat on hard substrates, and the branching blades of both species create small, sometimes circular, cuplike patterns. *Caulerpa verticillata* is darker green in life, however, and often is taller, with many whorls of branches formed along a single stalk. In our collections, the two species occurred together, sometimes intertwining on a single rock on protected and exposed areas of the reef.

Light intensity at the time of the original collection was low, the water turbid because of recent stormy weather. The visibility at the site may exceed 10 m, however, during extended periods of calm.

The annual range of water temperature at the site is 26°C to 29.8°C, based on measurements taken from the surface to 11 m depth. The salinity ranges from 33.6 ppt to 38.8 ppt.

Systematic Discussion

Superficially, *Siphonoclathrus* appears to be related to *Microdictyon* (Siphonocladales), because both genera have small, green, translucent, monostromatic, net-like blades. *Siphonoclathrus* (Figs. 1-8) is clearly in the order Siphonales, however, as shown by the siphonous filaments with constrictions at the base of dichotomous branches (Figs. 7-8) characteristic of many members of the order, and by the possession of numerous small, discoid chromatophores, in contrast to the reticulate chromatophores characteristic of the Siphonocladales.

The order Siphonales and its various subgroups are discussed by A. and E. S. Gepp (1911) and Egerod (1952). *Siphonoclathrus* appears to have characteristics consistent with the family Codiaceae Kützing orth. mut. Hauck. It resembles the genus *Udotea* Lamouroux 1812 in that plants consist of a stipe and frond or fronds, the frond flabelliform or infundibuliform, sometimes proliferous. Some, but not all species of *Udotea* have papillae on the blade filaments, as in *Siphonoclathrus*. *Siphonoclathrus* differs from *Udotea* in that it lacks calcification, and because of its unique monostromatic net-like blades. While calcification alone is perhaps not a valid generic feature in itself as shown by Egerod (1952), it is a valuable distinguishing trait that should be considered in combination with other characteristics.

Siphonoclathrus is probably most closely related to the genus *Flabellaria* Lamouroux 1913, in the subfamily Flabellarieae, described by Gepp and Gepp, 1911, with both genera characteristically consisting of uncalcified stipe and frond (or fronds), the frond flabelliform and thin, composed of filaments free or slightly held together by a few simple lateral branchlets. *Siphonoclathrus* differs from *Flabellaria* in that fronds are net-like and commonly funnel-form (Fig. 5).

Siphonoclathrus, gen. nov.

Plants gregarious, erect, uncalcified, with thallus consisting of a rhizoidal base, a stipe of siphonous branching filaments, and flat or funnel-form monostromatic blade or blades borne terminally or laterally, composed of slightly adherent, dichotomously branching siphonous fila-

ments; filaments with projections that touch and adhere to adjacent filaments, creating a mesh or net-like appearance. Constrictions and thickenings of the cell wall occur at the point of branching. Growth occurs at the blade margin, sometimes creating a conspicuous band or growth zone.

Colonies of plants are apparently formed vegetatively through extensions of the rhizoidal base. Sexual reproduction unknown.

Siphonoclathrus stri, sp. nov.

Plants gregarious, erect, to 2 cm high, clear, pale green, attached with a rhizoidal base to limestone or shell; stipes usually branching, composed of adherent filaments (Fig. 6). Flat or funnel-form monostromatic blades, to 5 mm wide, develop laterally or terminally on the stipe, sometimes growing together at a point of contact, and occasionally proliferating new blades from old.

Blade filaments 2.5 to 3 μ wide, with numerous lateral projections 2 to 3 μ wide, 0.5 to 30 μ long, that touch adjacent filaments, forming a mesh.

Siphonoclathrus gen. nov.

Plantae gregariae, erectae, haud calcareae, e basi radicanti surgentes, stipite filamentoso ramificantique et apice aut lateribus lamina (vel laminis pluribus) plana aut infundibuliformi, monostromatica praeditae, quae filamentis leviter cohaerentibus et dichotome ramosis composita est. Filamenta laminam reticulatam formantia, sese lateraliter ramulis brevissimis tangentia. Lamina in latere crescens, interdum zonam meristematicam sat conspicuam formans. Coloniae plantarum formantur, ut videtur, modo vegetativo extensione baseos rhizoidali. Reproductio sexualis ignota.

Sipronoclathrus stri sp. nov.

Plantae gregariae, erectae, ad 2 cm altae, pellucidae, pallide virides, basi rhizoidali saxo calcareo vel conchis affixae; stipites vulgo ramificantes, e filamentis cohaerentibus 2.5 μ usque 3μ latis contexti. Laminae monostromaticae planae aut infundibuliformae, ad 5 mm latae, lateraliter aut terminaliter e stipite oriuntur, interdum puncto commissurae conferruminatae et nonnunquam laminas secundarias e vetustioribus efferentes. Filamenta laminae 2.5 μ ad 3 μ lata, ramulis brevissimis 2 μ ad 3 μ latis munita, qui filamenta adjacentia tangunt et ita reticulum interstitiis formant.

Type collection: Plants collected by Sylvia A. Earle and Joyce Redemsky Young, June 30, 1971, on limestone in 8 m depth, Galeta Reef, Caribbean Sea, Panama, collection number SE71101.

Holotype: Deposited in the Farlow Herbarium of Cryptogamic Botany, Harvard University, Cambridge, Massachusetts.

Syntypes: Deposited in the U. S. National Herbarium, Washington, D.C.; Algal Herbarium, University of California, Berkeley.

The name, *Siphonoclathrus,* is derived from the Latin *siphon,* meaning a tube or siphon, to describe the basic structure of the plant, and the Latin *clathrus,* meaning a structure pierced with openings, as in a grating or trellis, referring to the net-like appearance of the blades. The specific epithet, *stri,* is an arbitrary assemblage of letters.

Acknowledgements

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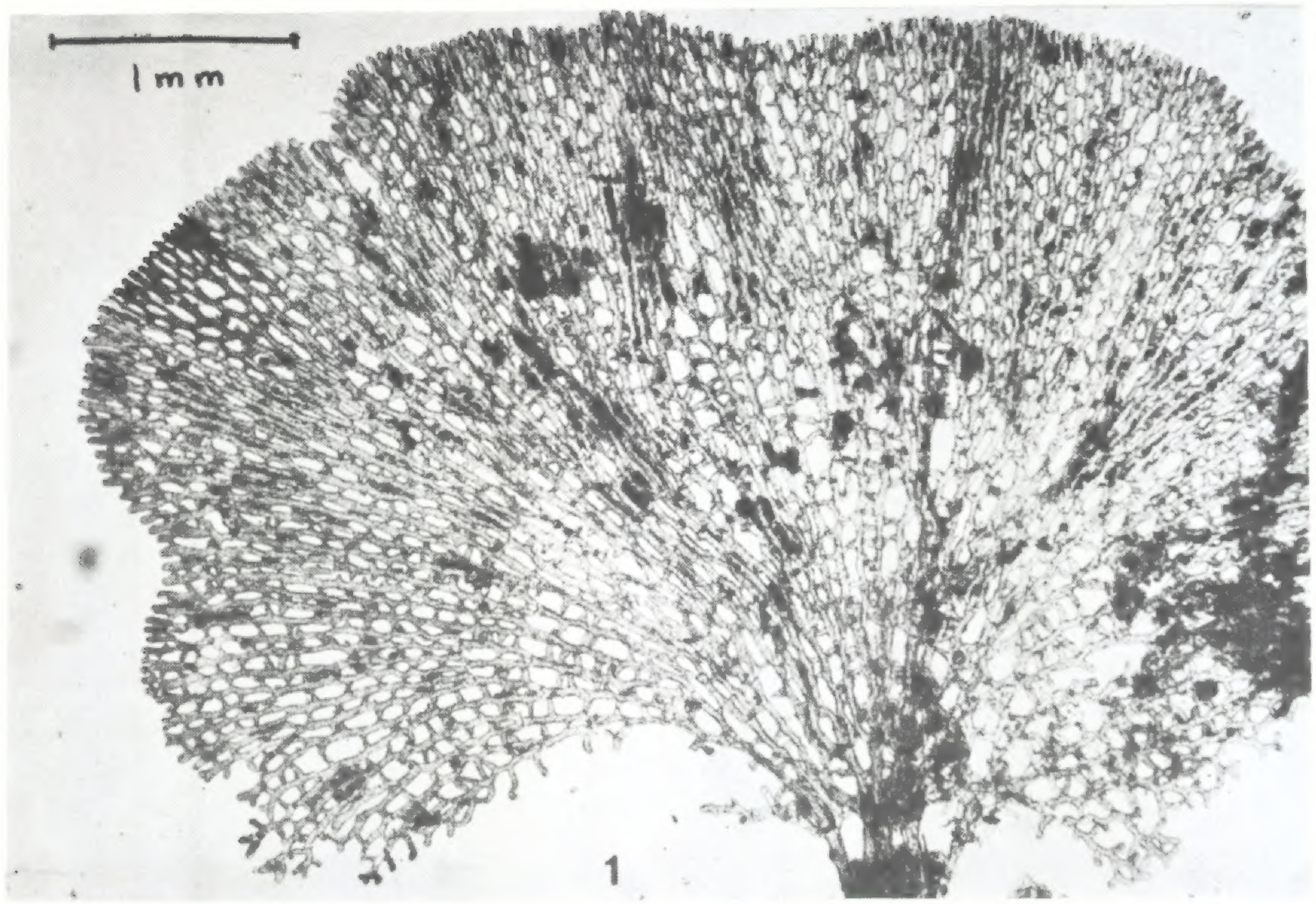


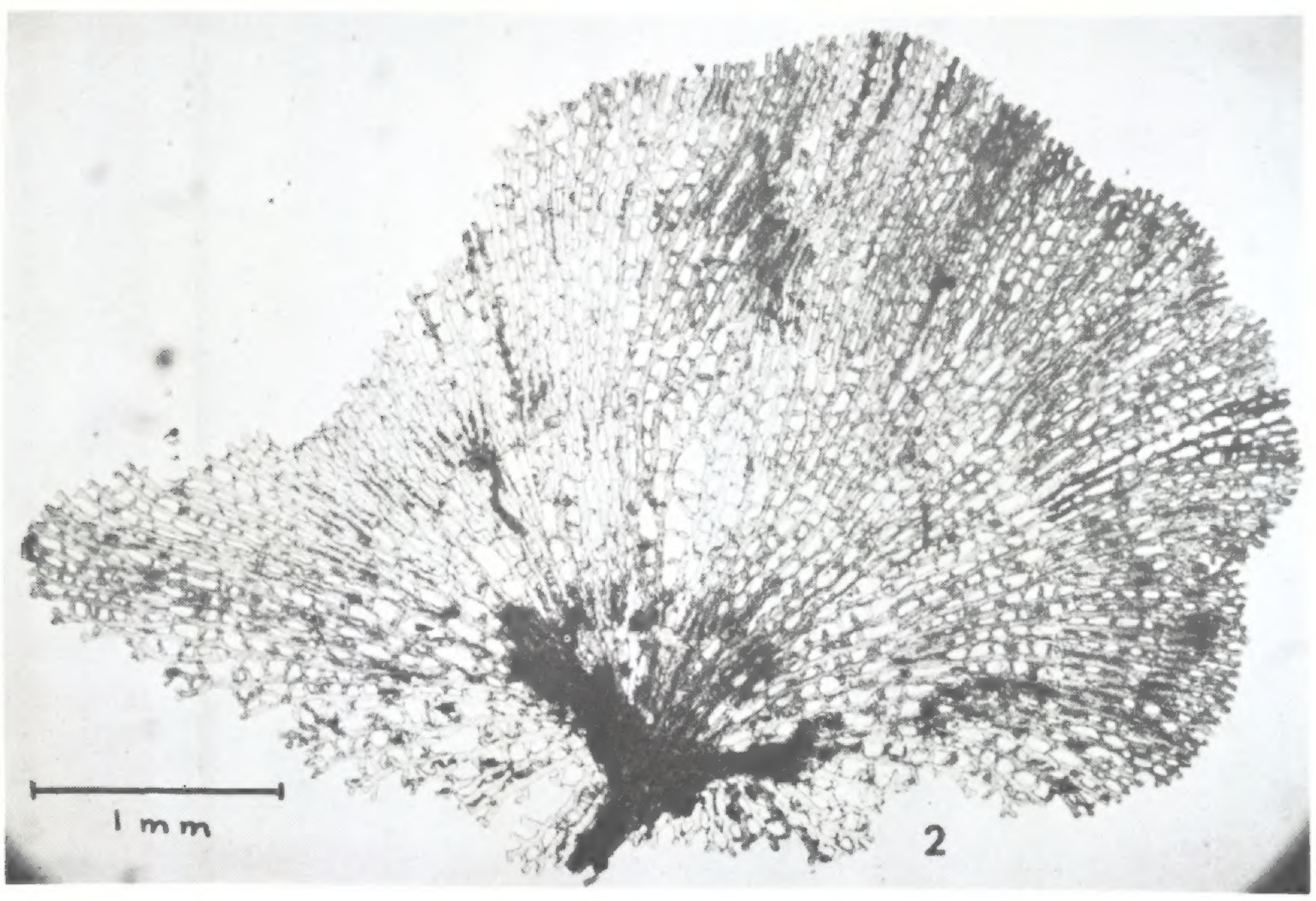


FIG. 1. Photomicrograph of a small blade of *Siphonoclathrus stri* showing general form and net-like structure.

FIG. 2. Photomicrograph of a small blade of *Siphonoclathrus stri* showing growth area along margin.

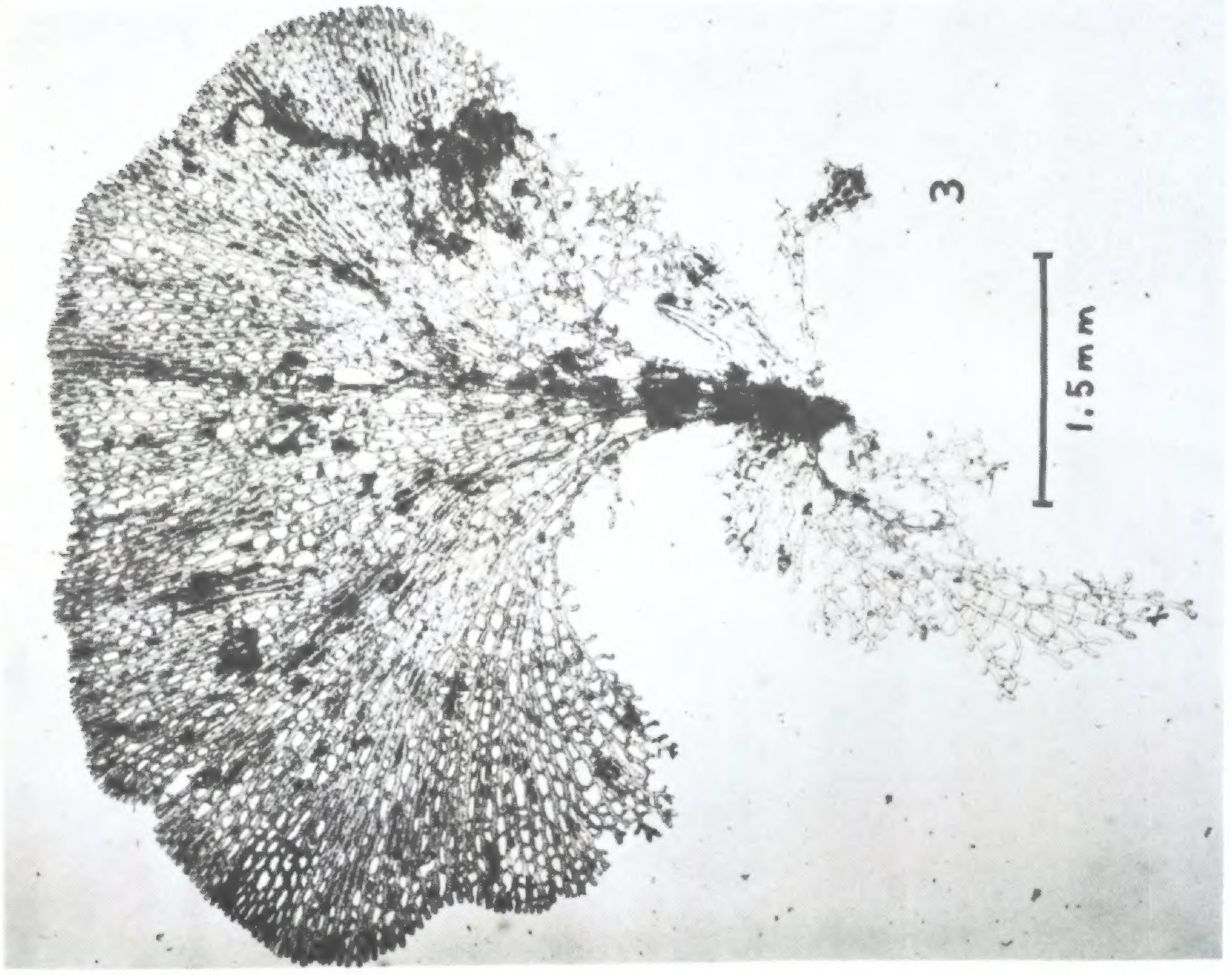


FIG. 3. Photomicrograph of a small *Siphonoclathrus stri* plant from the original collection.

FIG. 4. Photomicrograph of the holotype of *Siphonoclathrus stri*.

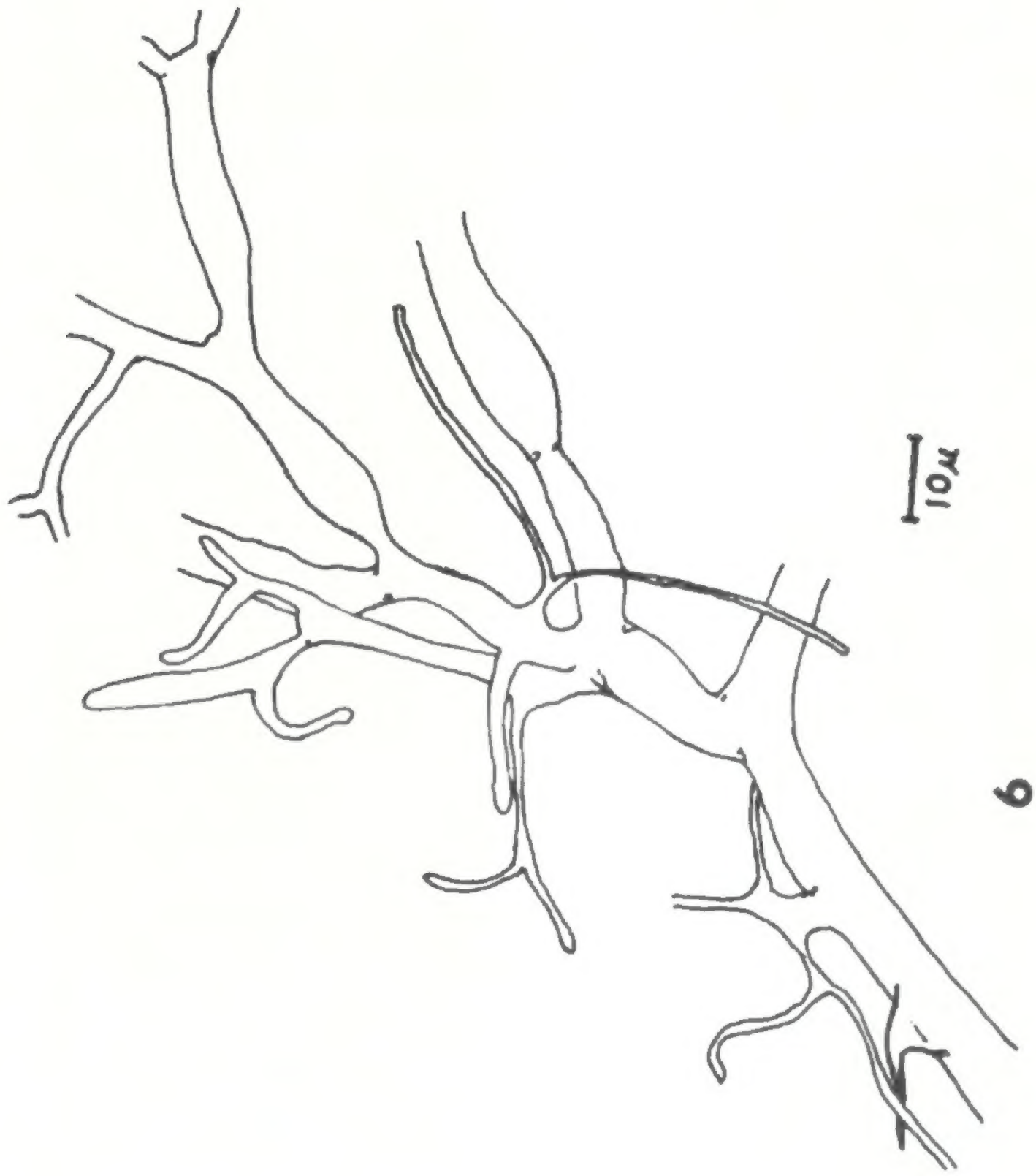
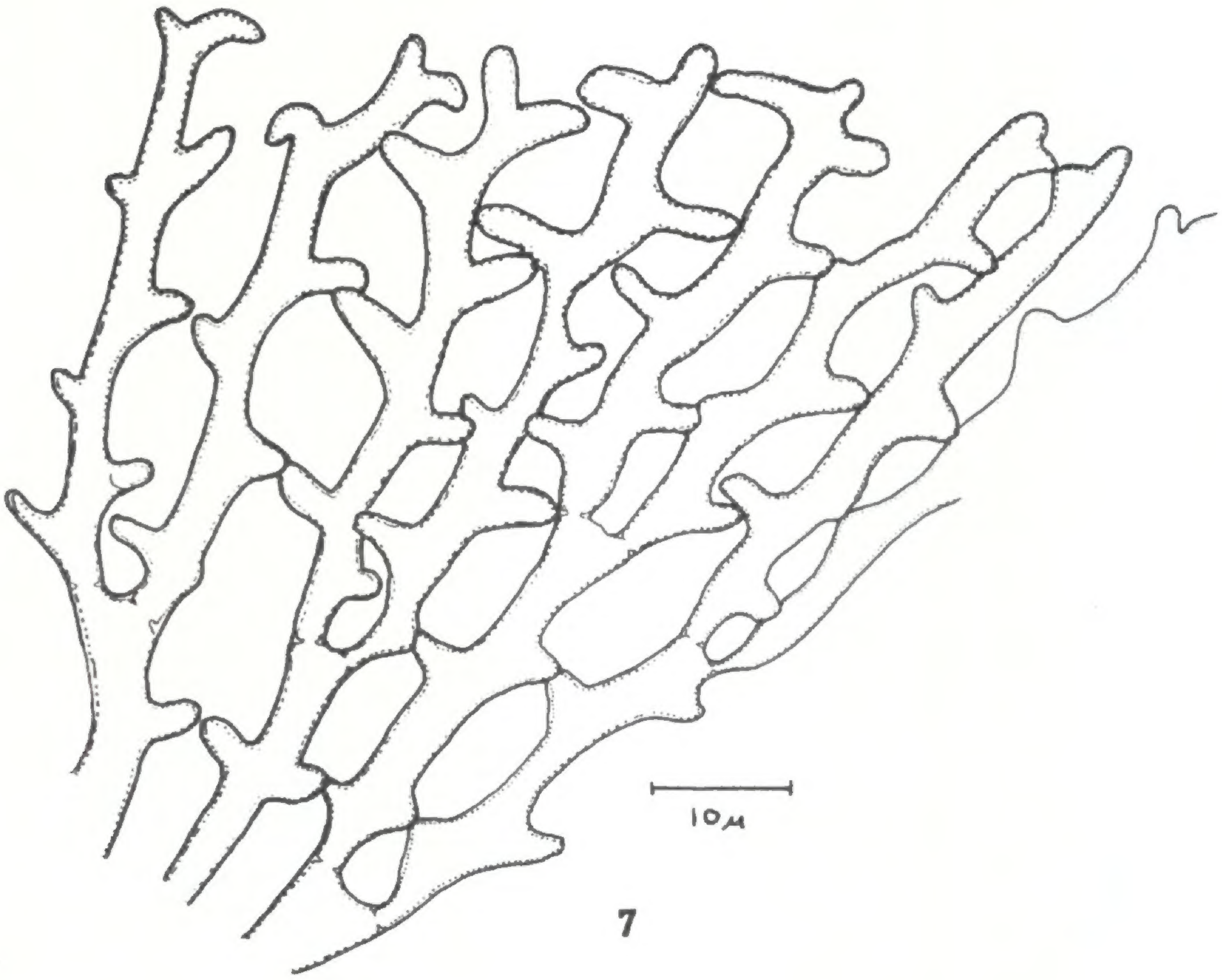


FIG. 5. Camera lucida drawing showing habit of a single infundibuliform plant.

FIG. 6. Camera lucida drawing of stipe filaments.



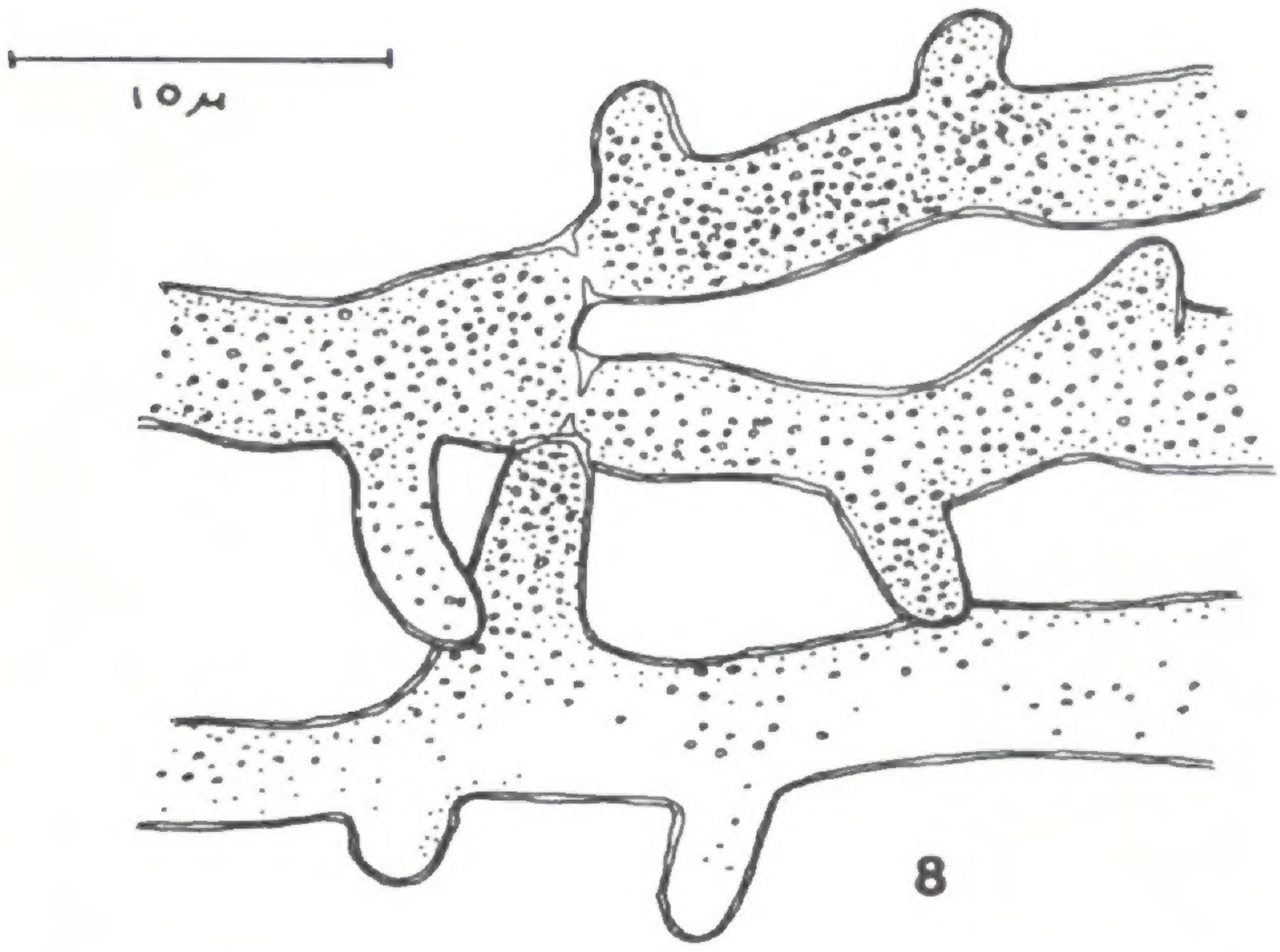


FIG. 7. Camera lucida drawing of blade filaments of *Siphonoclathrus stri* showing branching habit.

FIG. 8. Camera lucida drawing of blade filaments showing chromatophores and thickenings and constrictions at point of branching.